The opinion in support of the decision being entered today was **not** written for publication and is **not** binding precedent of the Board.

Paper No. 17

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Ex parte STEPHAN HÜFFER,
JOACHIM RÖSCH,
STEFAN SEELERT,
FRANZ LANGHAUSER,
DIETER LILGE,
ROLAND HINGMANN,
and
GUNTHER SCHWEIER

Appeal No. 2002-0683 Application No. 09/041,698 FEB 21 2003

PAT & T.M. OFFICE
BOARD OF PATERIERENCES
BOARD INTERFERENCES

ON BRIEF

Before LIEBERMAN, PAWLIKOWSKI, and MOORE, <u>Administrative Patent Judges</u>. LIEBERMAN, Administrative Patent Judge.

DECISION ON APPEAL

This is an appeal under 35 U.S.C. § 134 from the decision of the examiner refusing to allow claims 3 through 11, which are all the claims pending in this application.¹

¹An amendment was submitted in conjunction with the Reply Brief cancelling claims 12 and 14 (See Paper No. 14).

THE INVENTION

The invention is directed to a process for the preparation of homopolymers of propylene in the presence of a Ziegler-Natta catalyst. The catalyst contains a titanium solid component prepared utilizing specific methodology and physical parameters. Additional limitations are described in the following illustrative claim.

THE CLAIM

Claim 3 is illustrative of appellants' invention and is reproduced below:

- 3. A process for the preparation of propylene homopolymers by polymerizing propylene at from 20 to 150°C and from 1 to 100 bar in the presence of a Ziegler-Natta catalyst system containing, as active components,
 - a) a titanium-containing solid component which is obtained by reacting a titanium halide with a chlorine-free compound of magnesium, an inorganic oxide as a carrier, a C_1 - C_8 -alkanol and an electron donor compound by a method in which,

in a first stage, a solution of the chlorine-free compound of magnesium in an inert solvent is added to the inorganic oxide as a carrier, this mixture is allowed to react for from 0.5 to 5 hours at from 10 to 120°C and then reacted, at from -20 to 80°C with constant mixing, with a C_1 - C_8 -alkanol in at least a 1.3-fold molar excess, based on the compound of magnesium, to give a chlorine-free intermediate, the titanium halide and the electron donor compound are then added to said intermediate, the resulting mixture is allowed to react for at least 10 minutes at from 10 to 150°C and the solid substance thus obtained is then filtered off and washed and

in a second stage, the solid obtained from the first stage is extracted in an inert solvent containing at least 5% by weight of titanium tetrachloride and is washed with a liquid alkane,

and as cocatalysts,

- b) an aluminum compound and
- c) a further electron donor compound,

the molar ratio of the aluminum compound b) to the further electron donor compound c) in the polymerization being from 1.5:1 to 9:1.

THE REFERENCES OF RECORD

As evidence of obviousness, the examiner relies upon the following references:

Noristi et al. (Noristi)

5,244,854

Sep. 14, 1993

Shinosaki et al. (Shinosaki)

07-025946

Jan. 27, 1995

(published Japanese Kokai Patent Application)

THE REJECTION

Claims 3 through 11 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Noristi or Shinosaki.²

OPINION

We have carefully considered all of the arguments advanced by the appellant and the examiner and agree with the examiner that the rejection of the claims under Section 103(a) is well founded. Accordingly, we affirm this rejection.

As an initial matter, the appellants have stated that, "claims 3-11, may be considered to stand or fall together." See Brief, page 3. Accordingly, we select claim 3, the sole independent claim as representative of the claimed subject matter and limit our

²The rejection of claims 12 and 14 under 35 U.S.C. § 102(b) is rendered moot by the cancellation of those claims.

consideration thereto. See 37 CFR §1.192(c)(7) (2000).

The Rejection under Section 103(a)

It is appellants' position that, "Noristi et al. (Noristi) neither discloses nor suggests applicants' process for preparing propylene homopolymers as set forth in claim 3, nor does Shinosaki et al. (Shinosaki)." See Brief, page 4. We disagree.

Noristi discloses the preparation of catalysts used in the homopolymerization of olefins. See column 6, lines 55-57. Homopolymeric polypropylene is specifically exemplified. See Example 1. We find that the polymerization temperature of 0 to 150°C overlaps the polymerization temperature of the claimed subject matter. See column 6, lines 52-54. We further find that the pressure of atmospheric pressure or higher, id., corresponds to 1 or more Bar as required by the claimed subject matter. As the disclosure of Noristi generally corresponds to a Ziegler-Natta catalyst system, we conclude that the polymerization process is disclosed by Noristi of record.

We further find that Noristi discloses and suggests each of the limitations for the preparation of the catalyst component. Noristi discloses a multi step process where in a first stage a solution of chlorine free magnesium compound in an inert solvent is added to an inorganic oxide and only subsequently reacted with a titanium compound such as titanium tetrachloride. In particular, we find that Mg is supported on the metal oxide prior to reaction with a titanium compound. See column 3, lines 20-23, and lines 42-46. We find that Example 4 discloses the impregnation of silica by maintaining contact between magnesium chloride and silica at 60°C for 4 hours. Example 8 which refers back to

Example 4 utilizes other solvents but significantly follows the procedure of Example 4. We find that Example 9 which refers back to Example 8 uses a solution of a chlorine free compound of magnesium, hexyl ethoxy magnesium in an inert solvent, i.e., heptane. Accordingly, the Examples specifically disclose the first step both with respect to the components utilized and the temperature conditions required by the claimed subject matter. We further find in support of our position that Example 13 discloses the reaction of butyl ethyl magnesium with silica for 1 hour in an inert solvent, i.e., hexane.

As for the subsequent reaction with an alcohol, we find that Noristi discloses that, "[w]hen the metal oxide support is impregnated with magnesium compounds containing Mg-C bonds, in particular Mg-alkyl bonds, in order to have a high activity of the catalysts, it is necessary to transform said magnesium compounds, prior to the reaction with the titanium compound, into magnesium dihalides or into compounds which are not longer capable of reducing the tetravalent titanium (i.e.[,] they do not contain Mg-C bonds), and can be transformed into magnesium dihalides by reaction with the titanium halide or halogen alcoholate. To accomplish this purpose the metal oxide support containing the Mg compound with Mg-C bonds is reacted with compounds such as alcohols." See column 5, lines 7-22. We further find in this respect that these compounds, i.e., alcohols are reacted with the Mg-C compounds in stoichiometric excess at temperatures of 0° to 150°C. Based upon the above findings, we conclude that the second step of the first stage is disclosed by Noristi, which second step results in a chlorine free intermediate. Only then does the reaction with titanium halide occur. Indeed, Noristi discloses that the electron

donor and the titanium compound may be reacted before or at the same time. See column 5, lines 33-36.

As to the second stage required by the claimed subject matter, we find that the washing step is generally disclosed at column 4, line 65 to column 5, line 7, wherein it is stated that the resulting solid is washed with anhydrous hexane or heptane. We further find that the treatment with titanium compound can be repeated. Id. Moreover, in Example 1 that following reaction of the solid support with titanium tetrachloride, "the reaction of the filtered solid with TiCl₄ is carried out (titanation) by introducing the filtered solid and 200 cm³ of fresh TiCl₄ into the reactor, by bringing the temperature again to 100° C. and maintaining for 2 hours. Finally the TiCl₄ is filtered, the solid is washed with hexane twice at 60° C and 3 times at ambient temperature." We conclude that the 200 cm³ of titanium chloride in 7g of the solid support meets the requirement of the claimed subject matter that "at least 5% by weight of titanium chloride," is present. Although it is unclear whether the inert solvent is present in conjunction with the titanium tetrachloride, we conclude that the presence of an inert solvent added simultaneously or sequentially is a matter within the skill of the art, particularly as solvent is present in one or more washing steps with the repetitive addition of titanium tetrachloride.

As for the balance of the limitations in claim 3, we find that election donors are disclosed in column 5, line 36 to column 6, line 2. Finally, we find that aluminum compounds are disclosed at column 6, lines 4-17. We find that the aluminum compound may further be utilized with an electron donor in the molar ratio required by the claimed

subject matter. See column 6, lines 25-28.

Based upon the above factual findings, we conclude that Noristi is sufficient to establish a prima facie case of obviousness with respect to the claimed subject matter.

Furthermore, the examiner has treated the claimed subject matter as one containing a product by process limitation directed to the catalyst production. The examiner finds that the solid titanium catalysts of the prior art are, "substantially similar to that of the instant claims." See Answer, page 3. The examiner thereafter concludes that inasmuch, as, "the prior art discloses a product which reasonably appears to be either identical with or only slightly different that a product claimed in a product-by-process claim . . . the burden [of proof] is placed on applicant[s] . . . to come forward with evidence establishing unobvious differences between the claimed product and the product prior art. See Answer, page 7. Although not expressly articulated, the examiner is concerned with the language of the claimed subject matter, which is directed to, "a titanium-containing solid component which is obtained by " (Emphasis ours). The language inserts a product-by-process limitation into a process claim.

We agree with the examiner that the inventive concept includes the polymerization of homopolymeric polypropylene wherein the catalyst is a product formed by a particular sequence of reactive steps. It is unequivocally clear from the above findings and conclusions that Noristi discloses a catalyst system for the homopolymerization of propylene which is very similar to or substantially the same as that of the claimed subject matter. The patentability of a product claimed in a product-by-process claim is determined

based on the product itself, not on the method of making it. See In re Thorpe, 777 F.2d 695, 697, 227 USPQ 964, 966 (Fed. Cir. 1985) ("[i]f the product in a product-by-process claim is the same as . . . a product of the prior art, the claim is unpatentable even though the prior art product was made by a different process.") Whether a rejection is under 35 U.S.C. § 102 or 35 U.S.C. § 103, when appellants' product and that of the prior art appears to be identical or substantially identical, the burden shifts to appellants to provide evidence that the prior art product does not necessarily or inherently possess the relied-upon characteristics of appellants' claimed product. See In re Fitzgerald, 619 F.2d 67, 70, 205 USPQ 594, 596 (CCPA 1980); In re Best, 562 F.2d 1252, 1255-56, 195 USPQ 430, 433-34 (CCPA 1977); In re Fessmann, 489 F.2d 742, 744, 180 USPQ 324, 326 (CCPA 1974). The reason is that the Patent and Trademark Office is not able to manufacture and compare products. See Best, 562 F.2d at 1255, 195 USPQ at 434; In re Brown, 459 F.2d 531, 535, 173 USPQ 685, 688 (CCPA 1972).

On the record before us, the products of both the claimed subject matter and the references of record are prepared by essentially the same process, that of catalyst preparation, differing at most in the presence of an inert solvent in one step of the process.

For the foregoing reasons, we determine that the examiner has established a <u>prima</u> <u>facie</u> case of obviousness in view of the references of record. Accordingly, the rejection is affirmed.

A discussion of Shinosaki is not needed in reaching our decision.

DECISION

The rejection of claims 3 through 11 under 35 U.S.C. §103(a) as being unpatentable over Noristi or Shinosaki is affirmed.

The decision of the examiner is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED

PAUL MEBERMAN
Administrative Patent Judge

| BOARD OF PATENT
| BEVERLY A. PAWLIKOWSKI | APPEALS
| Administrative Patent Judge | INTERFERENCES
| AMD | INTERFERENCES
| AMES T. MOORE | Administrative Patent Judge | Admi

Appeal No. 2002-0683 Application No. 09/041,698

KEIL & WEINKAUF 1350 CONNECTICUT AVENUE, N.W. WASHINGTON, D.C. 20036